Preface

Patients with chronic arthritis have seen enormous progress not only in the understanding of disease mechanisms but also in the development and introduction into clinical practice of new drugs and strategies. For patients with systemic autoimmune diseases, more hope appears to be on the horizon as these fields aim to catch up with the arthritis community. Innovative research remains essential to cover new grounds and to provide solutions for lingering clinical problems. This issue of *Best Practice and Research Clinical Rheumatology* has a focus on new research areas in musculoskeletal and autoimmune diseases. Many observations summarized in the different reviews show that new approaches, novel technologies and previously uncharted territory are currently under intense investigation and may bring important insights towards the clinic.

Catrina and van der Woude highlight the relationships between immunogenetics and the development of rheumatoid arthritis. The growing knowledge and the intense interest into the events occurring before clinical arthritis develops, illustrates how researchers and clinicians in this field are gradually moving towards potential prevention of disease. In spondyloarthritis, the immune landscape has recently been redesigned. Venken and Elewaut discuss how the identification of novel, often relatively rare, cytokine-producing immune cell populations are being documented in patients with spondyloarthritis and become part of a complex inflammatory network. They also indicate a number of challenges in the field.

Inflammation is a necessary and therefore often-helpful process in physiology, provided a return to homeostasis can be achieved. Therefore, our body can use a

number of inflammation resolving systems that control this return to homeostasis after an infection or another immune challenge. The team of Ioan-Facsinay discusses how such mediators of inflammation may be derived from lipids and what their roles could be in rheumatoid arthritis and osteoarthritis respectively. Another important challenge in osteoarthritis has been the study of genetic factors that contribute to disease and more in particular how to integrate these findings into a pathophysiological paradigm. A growing number of research teams are investing into this. The team of Meulenbelt illustrates how this can be done using practical examples.

Insights into disease mechanisms and the development of therapeutics are often not possible without involving animal research. Stakeholders and the general public increasingly question such an approach. Therefore there is a clear need to optimize these types of experiments. A chapter on preclinical imaging by vande Velde and Marenzana shows how modern imaging is a great tool to do better research, quantify data over time and thereby refine and reduce the use of animal models.

In the chapter from Young and coll. the authors illustrate how metabolomics can be used not only to stratify patients but also to predict response to treatment, a key achievement in personalized medicine.

A better understanding of the pathogenic process and histological involvement is also deemed critical to discriminate different processed and to support a process driven therapeutic approach in conditions whose clinical spectrum is broad and often overlapping. The review provided in this issue by Dr. Colafrancesco focuses on the importance of the integrated use of histology and serum detection of myositis-

associated autoantibodies, again highlighting the use of tools suitable for diagnosis purposes but also to stratify patients according to disease severity and prognosis.

Dr. Del Papa provides a detailed overview on the new therapeutic approaches for scleroderma, a complex autoimmune disease whose pathogenesis encompasses vascular injury, autoimmunity and fibrosis. Accordingly, the authors suggest that a comprehensive therapeutic strategy for scleroderma has to consider the targeting of the immuno-mediated inflammatory activity, the microvascular abnormalities and the fibrotic changes. This review, while reflecting on the significant progress made on the identification of molecular pathways involved in Scleroderma pathogenesis still highlights the paucity of treatment options for skin and internal organ manifestations.

A different therapeutic horizon is instead prospecting for Sjogren's syndrome as reviewed by Nocturne and coll.. The efforts made to define clearer measures of outcome for Sjogren's syndrome and the increased understanding of the disease pathogenesis has supported the development of novel therapies, alongside the repurposing of drugs from alternative indications for this disease. While novel biological compounds are currently tested in early phases clinical trials the data are already available from the first studies using B cell targeting therapies are summarized in the chapter alongside limitations and reflection on study design and future prospects.

Systemic lupus erythematous (SLE) also represents a relatively novel indication for biological treatment. Whilst, SLE suffered in early phases clinical trial because of mistakes in trial design and outcome measures, some of B cell targeting therapies have been success in randomized clinical trials as described in the review by Bakshi

et coll.. The authors finally reflect in the possibility ti use anti-T cell and anti-cytokine therapies for this condition.

As guest editors, we hope that the articles provided in this issue spark discussion and trigger interest by researcher and clinicians to further contribute to better understanding and in the longer term treatment of the different disease the rheumatology community is concerned with.

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